



## Subject card

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|---|--|--|---|---|-------------------|--|-----|
| Subject name and code                       | Geoengineering, PG_00036783  |  |   |   |                   |  |     |
| Field of study                              | Civil Engineering  |  |   |   |                   |  |     |
| Date of commencement of studies             | February 2025  | Academic year of realisation of subject                  |   |   | 2024/2025         |  |     |
| Education level                             | second-cycle studies   | Subject group  |   |   |                   |  |     |
| Mode of study                               | Full-time studies  | Mode of delivery   |   |   | at the university |  |     |
| Year of study                               | 1  | Language of instruction                                  |   |   | Polish            |  |     |
| Semester of study                           | 1  | ECTS credits   |   |   | 2.0               |  |     |
| Learning profile                            | general academic profile   | Assessment form  |   |   | assessment        |  |     |
| Conducting unit                             | Faculty of Civil and Environmental Engineering   |  |   |   |                   |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr inż. Angelika Duszyńska                               |   |   |                   |  |     |
|   | Teachers   |  |   |   |                   |  |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial  | Laboratory  | Project           | Seminar  | SUM |
|   | Number of study hours  | 30.0   | 15.0  | 0.0   | 0.0               | 0.0  | 45  |
|   | E-learning hours included: 0.0   |  |   |   |                   |  |     |
| Learning activity and number of study hours | Learning activity  | Participation in didactic classes included in study plan | Participation in consultation hours   |   | Self-study        |  | SUM |
|   | Number of study hours  | 45   | 8.0   |   | 7.0               |  | 60  |
| Subject objectives                          | The aim of the subject is to provide new possibilities in application of geoengineering solutions in practice of civile and environmental engineering.   |  |   |   |                   |  |     |
| Learning outcomes                           | Course outcome   |  | Subject outcome   |   |                   | Method of verification   |     |
|   | [K7_K03] can think and act creatively and enterprisingly and works for society   |  | Student is able to design the soft subsoil improvement with vertical drains as more economic and ecologic solution is applied. Student is able to apply new materials and technologies in geoengineering. |   |                   | [SK5] Assessment of ability to solve problems that arise in practice |     |
|   | [K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements   |  | Student is able to design an anchor system for sheet pile wall as a suport of excavation using the results of CPTU tests.   |   |                   | [SW3] Assessment of knowledge contained in written work and projects |     |
| Subject contents                            | Bases of geotechnical design with new generation of Eurocodes. Role of soil investigation in the proces of construction. Landslides reasons, results, practical solutions modern method of slope protection. Innovative technologies of subsoil improvement. Underground structures trenchless tunneling with relations to current constructions in Poland and abroad. Application of vertical drains technology. Interpretation of in-situ soil investigation and their application in subsoil improvement design. Ground anchors design. |  |   |   |                   |  |     |
| Prerequisites and co-requisites             | Knowledge of Soil Mechanics and Foundation Engineering   |  |   |   |                   |  |     |
| Assessment methods and criteria             | Subject passing criteria   |  | Passing threshold   |   |                   | Percentage of the final grade  |     |
|   | Design exercises   |  | 60.0%   |   |                   | 50.0%  |     |
|   | Test on lectures   |  | 60.0%   |   |                   | 50.0%  |     |
| Recommended reading                         | Basic literature   |  |   | T.Lunne, P.K.Robertson and J.J.M.Powell, Cone penetration testing in geotechnical practice, B A&P, 1997 |                   |  |     |
|   |  |  |   | Canadian Geotechnical Journal   |                   |  |     |

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|  | Supplementary literature   | <p>Proceedings European Conference of Soil Mechanics and Geotechnical Engineering - Edinbourg 2015 i Reykjavik 2018</p> <p>Acta Geotechnica</p> <p>L.Balachowski, Physical modeling in sands in a wide range of stress level, application to the calibration of CPTU and DMT tests, Politechnika Gdańska. Monografia 88. 2008.</p> <p><a href="http://www.geosoft.com">www.geosoft.com</a>, <a href="http://www.geostru.com">www.geostru.com</a>, <a href="http://www.geologismiki.gr">www.geologismiki.gr</a></p> |
|  | eResources addresses   | Adresy na platformie eNauczenie:   |
| Example issues/<br>example questions/<br>tasks being completed | <p>Stability of embankments on soft subsoil</p> <p>Acceleration methods of subsoil consolidation</p> <p>Interpretation of subsoil parameters with CPTU method and laboratory tests</p> <p>Bearing capacity of single ground anchor</p> |  |
| Work placement   | Not applicable   |  |

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